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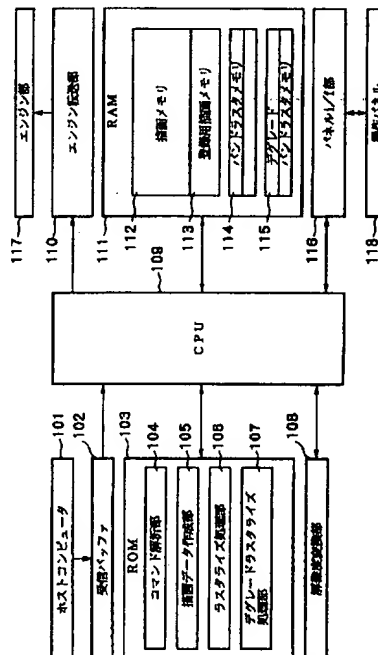
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(54) 【発明の名称】 出力制御方法及びその装置とそのコンピュータプログラム製品

(57) 【要約】 (修正有)

【課題】 登録された情報を用いて出力する際、その登録されている情報を現時点の属性に合わせて変換して出力できる出力制御方法。

【解決手段】 ホストコンピュータ101より送信されるフォームデータとその解像度或は用紙サイズ等の属性情報を受信するとフォームデータを中間データに変換し属性情報とともに登録用描画メモリ112に登録する。そして、ホストコンピュータ101よりフォームオーバーレイ印刷が指示されると、受信した印刷データとフォームデータ(中間データ)との解像度或は用紙サイズが一致するかどうかを判断し、一致しないときは、デグレードラスタライズ処理部107或は解像度変換部108により、その受信した印刷データの解像度或は用紙サイズに変換して印刷する。



JP-A No. 8-286860

[Title of the Invention]

METHOD AND APPARATUS FOR CONTROLLING OUTPUT AND

5 COMPUTER PROGRAM PRODUCT THEREOF

[Abstract]

[Object]

An output control method in which output can be performed by converting entered information
10 corresponding to a current attribute when the output is performed with the entered information.

[Solving Means]

When form data transmitted from a host computer 101 and attribute information such as a resolution or
15 a paper size of the form data are received, the form data is converted into intermediate data to enter the intermediate data and the attribute information in an entry imaging memory 112. When the host computer 101 directs a printer apparatus to perform form overlay
20 print, it is determined whether the resolution or the paper size of the received print data corresponds to the resolution or the paper size of the form data (intermediate data). When the resolution or the paper size of the received print data does not
25 correspond to the resolution or the paper size of the form data, a degradation rasterization processing unit 107 or a resolution conversion unit 108 converts

the resolution or the paper size of the form data the form data into the resolution or the paper size of the received print data, and the print is performed.

5 [What is Claimed is:]

1. An output control apparatus which receives data from an external device to perform output, the apparatus comprising:

entering means for entering information and
10 attributing information of the entered information;

converting means for converting the entered information according to the attribute information indicated by the data received from the external device, when the data directs that an outputting
15 process is performed with the entered information; and

controlling means for performing control so as to perform the outputting process with the entered information converted by the converting means.

20

2. An output control apparatus according to claim 1, wherein the entered information is intermediate data which is processed in order to easily output the entry data from the external device.

25

3. An output control apparatus according to claim 2, wherein the entry data is form overlay data.

4. An output control apparatus according to claim 2, wherein the entry data is font data.

5 5. An output control apparatus according to claim 2, wherein the attribute information is resolution information.

6. An output control apparatus according to
10 claim 2, wherein the attribute information is paper-size information which outputs the entered information.

7. An output control apparatus according to
15 claim 1, wherein the converting means re-creates the entered information when the attribute information of the entered information does not correspond to the attribute information of the data from the external device.

20

8. An output control apparatus according to claim 1, further comprising determining means for determining whether the outputting process is performed with the entered information or not, when
25 the data from the external device directs that the outputting process is performed with the entered information, in the case where the attribute

information indicated by the data is different from the attribution of the entered information.

9. An output control apparatus according to
5 claim 8, wherein the controlling means performs the outputting process with the data from the external device, when the determining means determines that the outputting process is not performed with the entered information.

10

10. An output control method of receiving data from an external device to perform output, the method comprising the steps of:

entering information and attribute information
15 of the entered information;

converting the entered information according to the attribute information indicated by the data received from the external device, when the external device directs that an outputting process is
20 performed with the entered information; and

performing control so that the outputting process is performed with the converted entered information.

25 11. An output control method according to claim 10, wherein the entered information is intermediate data which is processed in order to easily output the

entry data from the external device

12. An output control method according to claim
11, wherein the entry data is form overlay data.

5

13. An output control method according to claim
11, wherein the entry data is font data.

14. An output control method according to claim
10 10, wherein the attribute information is resolution
information.

15. An output control method according to claim
10, wherein the attribute information is paper-size
15 information which outputs the entered information.

16. An output control method according to claim
10, wherein the entered information is re-created in
the converting step, when the attribute information
20 of the entered information does not correspond to the
attribute information of the data from the external
device.

17. An output control apparatus which receives
25 data from an external device to perform output, the
apparatus comprising:

entering means for entering information and

attribute information of the entered information;

converting means for converting the entered
information into image data according to the
attribute information indicated by the data received
5 from the external device, when the data directs that
an outputting process is performed with the entered
information; and

controlling means for performing control so as
to perform the process of outputting the data with
10 the image data converted by the converting means.

18. An output control apparatus according to
claim 17, wherein the entered information is
intermediate data which is processed in order to
15 easily output the entry data from the external device.

19. An output control apparatus according to
claim 17, wherein the converting means reduces the
image data, when resolution information of the
20 entered information is higher than a resolution of
the data from the external device.

20. An output control apparatus according to
claim 17, wherein the converting means enlarges the
25 image data, when the resolution information of the
entered information is lower than the resolution of
the data from the external device.

21. An output control apparatus according to claim 17, wherein the converting means reduces the image data, when a paper size of the entered
5 information is larger than the paper size of the data from the external device.

22. An output control apparatus according to claim 17, wherein the converting means enlarges the
10 image data, when the paper size of the entered information is smaller than the paper size of the data from the external device.

23. An output control method of receiving data
15 from an external device to perform output, the method comprising the steps of:

entering information and attribute information of the entered information;

converting the entered information into image
20 data according to the attribute information indicated by the data received from the external device, when the external device directs that an outputting process is performed with the entered information;
and

25 performing control so that the outputting process is performed using the converted image data.

24. An output control method according to claim 23, wherein the entered information is intermediate data which is processed in order to easily output the entry data from the external device.

5

25. An output control method according to claim 23, wherein the image data is reduced in the converting step, when resolution information of the entered information is higher than a resolution of
10 the data from the external device.

26. An output control method according to claim 23, wherein the image data is enlarged in the converting step, when the resolution information of
15 the entered information is lower than the resolution of the data from the external device.

27. An output control method according to claim 23, wherein the image data is reduced in the
20 converting step, when a paper size of the entered information is larger than the paper size of the data from the external device.

28. An output control method according to claim
25 23, wherein the image data is enlarged in the converting step, when the paper size of the entered information is smaller than the paper size of the

data from the external device.

29. A computer program product in which a
program code being able to be read by the computer
5 for outputting received data from an external device
to perform output, the computer program product
including a storage medium which can be used in the
computer, the product comprising:

an entering procedure code which enters
10 information and attribute information of the entered
information;

a converting procedure code which converts the
entered information according to the attribute
information indicated by the data from the external
15 device, when the external device directs that an
outputting process is performed with the entered
information; and

a controlling procedure code which performs
control so as to perform the outputting process with
20 the converted entered information.

30. A computer program product in which a
program code being able to be read by the computer
for outputting received data from an external device
25 to perform output, the computer program product
including a storage medium which can be used in the
computer, the product comprising:

an entering procedure code which enters information and attribute information of the entered information;

5 a converting procedure code which converts the entered information into image data according to the attribute information indicated by the data from the external device, when the external device directs that an outputting process is performed with the entered information; and

10 a controlling procedure code which performs control so that the outputting process is performed with the converted image data.

[Detailed Description of the Invention]

[0001]

15 [Technical Field to which the Invention Pertains]

The present invention relates to a method and apparatus for controlling output which can enter e.g. form overlay information to perform the output with the entered information, and a computer program
20 product thereof.

[0002]

[Prior Art]

Conventionally, in some printing apparatuses, a frequently-used regular-size form which utilizes
25 ruling lines, characters, and a half-tone dot meshing of a table such as a form can previously be entered as the form overlay into the printing apparatus, in

order to perform a printing process at high speed by decreasing the amount of data transferred from the external device such as a computer. In the case where such printing apparatuses are used, the
5 external device produces only a variable data portion and transmits the variable data portion to the printing apparatus, and the external device specifies the printing process with the form overlay, which allows the print to be performed with the regular-
10 size form. Further, a printer apparatus, in which not only the form data but also font data and macro data can be entered in the printer apparatus to perform the print with the form data, the font data, and the macro data, are well known.

15 [0003]

[Problems that the Invention is to Solve]

The entered attributes such as the form data, the font data, and the macro data are not always equal to the attribute information such as a
20 resolution in a print mode to be printed or a current print mode. Therefore, there are problems described below:

(1) When the resolution of the entered data is higher than that of the current print data, image data is
25 produced according to the resolution of the print data, so that the size of the entered form data is enlarged.

(2) In the case where the paper size of the entered data is larger than that of the print data, when print image data is produced by directly using the entered data, there is the problem that the print
5 cannot be performed.

[0004]

In view of the foregoing, an object of the invention is to provide a method and apparatus for controlling the output which can convert the entered
10 information according to a current attribute to perform the output when the output is performed with the entered information, and a computer program product thereof.

[0005]

15 Another object of the invention is to provide a method and apparatus for controlling the output which can convert the resolution of the entered information into the resolution of the data received from the external device to perform the output, and a computer
20 program product thereof.

[0006]

Another object of the invention is to provide a method and apparatus for controlling the output which can convert the size of the entered information
25 according to the size of the data received from the external device to perform the output, and a computer program product thereof.

[0007]

Another object of the invention is to provide a method and apparatus for controlling output in which the entered information can be stored in a less
5 memory capacity because it is unnecessary that the resolution or size of the entered information is entered according to the resolution or size of the data received from the external device, and a computer program product thereof.

10 [0008]

[Means for Solving the Problems]

In order to achieve the above object, an output control apparatus of the invention includes the following configuration. That is, an output control
15 apparatus which receives data from an external device to perform output, the apparatus comprising: entering means for entering information and attribute information of the entered information; converting means for converting the entered information
20 according to the attribute information indicated by the data received from the external device, when the data directs that an outputting process is performed with the entered information; and controlling means for performing control so as to perform the
25 outputting process with the entered information converted by the converting means.

[0009]

Further, in order to achieve the above object,
an output control apparatus of the invention includes
the following configuration. That is, an output
control apparatus which receives data from an
5 external device to perform output, the apparatus
comprising: entering means for entering information
and attribute information of the entered information;
converting means for converting the entered
information into image data according to the
10 attribute information indicated by the data received
from the external device, when the data directs that
an outputting process is performed with the entered
information; and controlling means for performing
control so as to perform the process of outputting
15 the data with the image data converted by the
converting means.

[0010]

In order to achieve the above object, an output
control method of the invention includes the
20 following configuration. That is, an output control
method of receiving data from an external device to
perform output, the method comprising the steps of:
entering information and attribute information of the
entered information; converting the entered
25 information according to the attribute information
indicated by the data received from the external
device, when the external device directs that an

outputting process is performed with the entered information; and performing control so as to perform the outputting process with the converted entered information.

5 [0011]

Further, in order to achieve the above object, an output control method of the invention includes the following configuration. That is, an output control method of receiving data from an external
10 device to perform output, the method comprising the steps of: entering information and attribute information of the entered information; converting the entered information into image data according to the attribute information indicated by the data
15 received from the external device, when the external device directs that an outputting process is performed with the entered information; and performing control so as to perform the outputting process with the converted image data.

20 [0012]

A computer program product of the invention includes the following configuration. That is, a computer program product in which a program code being able to be read by the computer for outputting
25 received data from an external device to perform output, the computer program product including a storage medium which can be used in the computer, the

product comprising: an entering procedure code which enters information and attribute information of the entered information; a converting procedure code which converts the entered information into image data according to the attribute information indicated by the data from the external device, when the external device directs that an outputting process is performed with the entered information; and a controlling procedure code which perform control so as to perform the outputting process with the converted image data.

[0013]

Other objects and advantages of the invention will become apparent from the embodiments taken in connection with the drawings. In the following descriptions, the same components are indicated by the same reference numeral in the accompanying drawings.

[0014]

[Mode for Carrying Out the Invention]

Referring now to the accompanying drawings, preferred embodiments of the invention will be described below.

[0015]

Fig. 1 is a block diagram showing a configuration of a controller of a laser beam printer according to an embodiment.

[0016]

In Fig. 1, the reference numeral 101 denotes a host computer which transmits print data and various pieces of data to the laser beam printer to cause the laser beam printer to perform the print. The reference numeral 102 denotes a reception buffer of the laser beam printer. The various pieces of data such as a command and the data which are received from the host computer 101 are temporarily stored in the reception buffer 102. The reference numeral 103 denotes a ROM in which various pieces of data such as programs (denoted by the reference numerals 104 to 107) for realizing a series of controls shown by flowcharts of Figs. 2 and 3 and fonts are stored.

[0017]

The reference numeral 104 denotes a command analyzing unit. The command analyzing unit 104 analyzes the command of the input data which is received from the host computer 101 and stored in the reception buffer 102. The reference numeral 105 denotes an imaging data producing unit which produces an imaging object (intermediate data) from the input data, which is temporarily stored in the reception buffer 102, to store the imaging object in an imaging memory 112 of RAM 111. The reference numeral 106 denotes a rasterization processing unit. The rasterization processing unit 106 rasterizes the

imaging object (intermediate data) stored in the
imaging memory 112 to produce the image data, and the
rasterization processing unit 106 stores the image
data the image data in a band unit in a degradation
5 band raster memory 115 of RAM 111. The reference
numeral 107 denotes a degradation rasterization
processing unit during resolution conversion
(degradation). The degradation rasterization
processing unit 107 rasterizes the post-resolution-
10 conversion imaging object (intermediate data) stored
in the imaging memory 112 to produce the image data,
and the degradation rasterization processing unit 107
stores the image data in a band unit in the
degradation band raster memory 115. The reference
15 numeral 108 denotes a resolution conversion unit
which performs the resolution when the imaging data
producing unit 105 produces the imaging object. As
used herein, the term of imaging object (intermediate
data) shall mean the data in which the input data is
20 process so that the image data is easily produced
from the input data such as PDL.

[0018]

The reference numeral 109 denotes a CPU which
controls the whole of the laser beam printer of the
25 invention according to the various control programs
stored in the ROM 103. The reference numeral 110
denotes an engine transfer unit which outputs the

image data in a raster form to an engine unit 117 of the printer apparatus. The reference numeral 111 denotes RAM which includes area memories shown by the reference numerals 112 to 115. The reference numeral

5 112 denotes an imaging memory in which the imaging object produced by the imaging data producing unit 105 is stored. The reference numeral 113 denotes an entry imaging memory for the intermediate data such as form data, font data, and macro data. The entry-

10 data imaging object produced by the imaging data producing unit 105 is stored in the entry imaging memory 113. The reference numeral 114 denotes a band raster memory in which the rasterized image data is stored. The reference numeral 115 denotes the

15 degradation band raster memory in which the rasterized image data is stored. The reference numeral 116 denotes a panel interface (I/F) unit which functions as an interface between the CPU 109 and an operation panel 118. The engine unit 117 is a

20 printer engine unit which performs the print by an electrophotographic method in the embodiment. However, the invention is not limited to the electrophotographic method. For example, the invention may be applied to the engine units which

25 perform the print by an inkjet method, a direct thermal method, and a thermal transfer method. The operation panel 118 includes various keys operated by

an operator and a liquid crystal display device for displaying a message and the like.

[0019]

Then, form data entry and an imaging operation
5 based on the form data entry in the laser beam
printer of the embodiment having the configuration
shown in Fig. 1 will be described referring to the
flowcharts shown in Figs. 2 and 3.

[0020]

10 Fig. 2 is the flowchart showing the process of
entering the form data transmitted to the printer
apparatus of the embodiment from the host computer
101.

[0021]

15 When the form data is received in Step S1, the
flow goes to Step S2. In Step S2, the host computer
101 converts the received form data into the
intermediate data, resolution information on the
intermediate data is added to enter the intermediate
20 data in the entry imaging memory 113.

[0022]

Fig. 3 is the flowchart showing a form overlay
printing process in which the form data entered
through the process of Fig. 2 is used.

25 [0023]

When print data is received from the host
computer 101 in Step S11, the flow goes to Step S12.

In Step S12, it is determined whether the host computer 101 directs the printer apparatus to perform the print data by the form overlay or not. When the host computer 101 does not direct the printer apparatus to perform the form overlay print, the flow goes to Step S17. In Step S17, the command analyzing unit 104 analyzes the command of the print data, the imaging data producing unit 105 expands the print data to the intermediate data, the rasterization processing unit 106 converts the intermediate data into the raster data (image data) to store the raster data in the band raster memory 114, and the raster data is transmitted from the engine transfer unit 110 to the engine unit 117 to perform the print.

15 [0024]

On the other hand, when the host computer 101 directs the printer apparatus to perform the form overlay print in Step S12, the flow goes to Step S13. In Step S13, the resolution of the entered form data in which the host computer 101 directs the printer apparatus to perform the form overlay print and the resolution of the received print data are compared. When these resolutions are equal to each other, the flow goes to Step S17. In Step S17, the image data in which the image of the entered form data and the image of the received print data are merged is produced, and the image data is transmitted from the

engine transfer unit 110 to the engine unit 117 to perform the print.

[0025]

On the other hand, when the resolution of the
5 entered form data and the resolution of the received
print data are different from each other in Step S13,
the flow goes to Step S14. In Step S14, it is
checked whether the imaging of the form data in which
the host computer 101 directs the printer apparatus
10 to perform the form overlay print is performed or not.
When it is determined that the imaging is not
performed, the flow goes to Step S18. In Step S18,
the process of imaging the entered form data is not
performed, but only the imaging data of the print
15 data is produced to perform the print. In Step S19,
attribute information on the entered form data is
displayed on the display device of the operation
panel 118.

[0026]

20 In the determination in Step S14, it is also
possible that the user of the host computer 101
determines that the form overlay print is not
required by transmitting the difference in resolution
between the form data (intermediate data) entered in
25 the printer apparatus and the received print data to
the host computer 101 in Step S13, or it is also
possible that the display device of the operation

panel 118 displays that the entered form data differs from the received print data in the resolution to make the determination based on the direction of the operator of the printer apparatus.

5 [0027]

On the other hand, in Step S14, when it is determined that the imaging of the entered form data is performed, the flow goes to Step S15. In Step S15, as a result of the determination in Step S13, when
10 the resolution of the entered form data is higher than that of the received print data, a reduction process is performed to the entered form data. On the contrary, when the resolution of the entered form data is lower than that of the received print data,
15 an enlargement process is performed to the entered form data. The resolution conversion process is performed by the resolution conversion process 108. The result of the resolution conversion is stored in the degradation band raster memory 115. It is also
20 possible that the resolution conversion process is executed the program stored in the ROM 103. Then, the flow goes to Step S16. In Step S16, the display device of the operation panel 118 displays the attribute information on the entered form data and
25 the reduced or enlarged result. Then, the flow goes to Step S17. In Step S17, the print image of the entered form data stored in the degradation band

raster memory 115 and the print image of the received print data are merged to perform the imaging process.
[0028]

As used herein, the term of reduction process
5 shall mean that the image data is produced while reduced when the entered form data (intermediate data) is rasterized, and the term of enlargement process shall mean that the image data is produced while enlarged when the entered form data
10 (intermediate data) is rasterized.
[0029]

[Second Embodiment]

Referring to flowcharts of Figs 4 and 5, a second embodiment of the invention will be described.
15 Because the configuration of the printer apparatus according to the second embodiment is similar to the configuration shown in Fig. 1, the description is not repeated.
[0030]

20 Fig. 4 is the flowchart showing the process of receiving the form data from the host computer to enter the form data in the printer apparatus. In Step S31, when the form data is received from the host computer 101, the flow goes to Step S32. In
25 Step S32, the form data is converted into the intermediate data, and the intermediate data and paper-size information corresponding to the form data

are entered in the entry imaging memory 113.

[0031]

Fig. 5 is the flowchart showing the form overlay printing process in which the form data
5 (intermediate data) entered through the process of Fig. 4 of the embodiment is used.

[0032]

In Step S41, when the print data is received from the host computer 101, the flow goes to Step S42.
10 In Step S42, it is determined whether the host computer 101 directs the printer apparatus to perform the print data by the form overlay or not. When the host computer 101 does not direct the printer apparatus to perform the form overlay print, the flow
15 goes to Step S48. In Step S48, the command analyzing unit 104 analyzes the command of the print data, the imaging data producing unit 105 expands the print data to the intermediate data, the rasterization processing unit 106 converts the intermediate data
20 into the raster data (image data) to store the raster data in the band raster memory 114, and the raster data is transmitted from the engine transfer unit 110 to the engine unit 117 to perform the print.

[0033]

25 On the other hand, when the host computer 101 directs the printer apparatus to perform the form overlay print in Step S42, the flow goes to Step S43.

In Step S43, the paper size of the entered form data in which the host computer 101 directs the printer apparatus to perform the form overlay print and the paper size specified by the received print data are compared. When these paper sizes are equal to each other, the flow goes to Step S47. In Step S47, the image data in which the image of the entered form data and the image of the received print data are merged is produced, and the image data is transmitted from the engine transfer unit 110 to the engine unit 117 to perform the print.

[0034]

On the other hand, when the paper size of the entered form data and the paper size of the received print data are different from each other in Step S43, the flow goes to Step S44. In Step S44, it is checked whether the imaging of the form data is performed or not. When it is determined that the imaging is not performed, the flow goes to Step S48. In Step S48, the process of imaging the entered form data is not performed, but only the image data of the print data is produced to perform the print. In Step S49, the attribute information on the entered form data is displayed on the display device of the operation panel 118.

[0035]

In the determination in Step S44, it is also

possible that the user of the host computer 101 determines that the form overlay print is not required by transmitting the difference in paper size between the form data (intermediate data) entered in the printer apparatus and the received print data to the host computer 101 in Step S43, or it is also possible that the display device of the operation panel 118 displays that the entered form data differs from the received print data in the paper size to make the determination based on the direction of the operator of the printer apparatus.

[0036]

On the other hand, in Step S44, when it is determined that the imaging of the form data is performed, the flow goes to Step S45. In Step S45, as a result of the determination in Step S43, when the paper size of the entered form data is larger than that of the received print data, the reduction process is performed to the entered form data (intermediate data). On the contrary, when the paper size of the entered form data is smaller than that of the received print data, the enlargement process is performed to the entered form data. Then, the flow goes to Step S46. In Step S46, the display device of the operation panel 118 displays the attribute information on the entered form data and the reduced or enlarged result. Then, the flow goes to Step S47.

In Step S47, the process of imaging the entered form data and the print data is performed. In this case, the reduction process and the enlargement process are similar to the processes described in the flowchart

5 of Fig. 3.

[0037]

In the second embodiment, the laser beam printer is used as the printer apparatus. However, the invention is not limited to the second embodiment.

10 For example, the invention can be applied to an inkjet printer, a dot matrix printer, a thermal transfer printer (including a sublimatic printer), an LED printer, and a liquid crystal shutter printer.

[0038]

15 It is possible that the intermediate data of the form data is produced again according to the resolution and size of the print data in Step S15 of Fig. 3 or in Step S45 of Fig. 5 and the results are displayed in Step S16 of Fig. 3 or in Step S46 of Fig.

20 5.

[0039]

In the embodiments, RAM is used as the imaging memory 112. However, it is also possible that NVRAM is used as the imaging memory 112.

25 [0040]

Although the form data is used as the entry data in the embodiments, it is also possible that the

font data, the macro data, and the like are used as the entry data.

[0041]

In the embodiments, when the entered form data
5 is different from the attribute information on the
print data, the operation panel 118 displays the
message. However, it is also possible to inform the
host computer 101 of that the entered form data is
different from the attribute information on the print
10 data to give a warning on the display device of the
host computer 101.

[0042]

After informing the host computer 101 that the
entered form data is different from the attribute
15 information on the print data, it is possible that
the user of the host computer 101 appropriately
selects whether the entered form data is imaged or
not.

[0043]

20 The invention may be applied not only to a
system including plural devices (for example, the
host computer, the interface device, a reader, and
the printer) but also to the apparatus including one
device (for example, a copying machine and a
25 facsimile machine).

[0044]

The object of the invention can also be

achieved such that the storage medium in which a program code of software for realizing the function of the embodiments is recorded provides the system or the apparatus and the computer of the system or the apparatus (or CPU or MPU) reads and executes the program code stored in the storage medium.

[0045]

In this case, the program code read from the storage medium realizes the function of the embodiments, and the storage medium itself in which the program code is stored constitutes the invention.

[0046]

For example, a floppy disk, a hard disk drive, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, magnetic tape, a non-volatile memory card, and a ROM can be used as the storage medium which provides the program code.

[0047]

Thus, the computer reads the program code from the storage medium to store the program code in RAM 112 and the computer executes the program code, which realizes the function of the embodiments. Further, the invention also includes the case in which OS (Operating System) run on the computer performs a part or the whole of the actual process based on the direction of the program code and the function of the embodiments is realized by the process.

[0048]

Further, the invention also includes the case in which, after the program code read from the storage medium is written in a feature expansion
5 board inserted in the computer or a feature expansion unit connected to the computer, the CPU or the like included in the feature expansion board or the feature expansion unit performs a part or the whole of the actual process based on the direction of the
10 program code and the function of the embodiments is realized by the process.

[0049]

When the invention is applied to the storage medium, the program code corresponding to the above-
15 described flowcharts is stored in the storage medium. To put it simply, each of the program modules in the ROM 103 of Fig. 1 is stored in the storage medium. That is, as shown in Fig. 6, the program codes which realize the function modules such as "input
20 processing module," "entry processing module," "conversion processing module," and "control processing module" can be stored in the storage medium. Although the case of the printing process is described in the embodiments, the invention is not
25 limited to the printing process. For example, the invention also includes the case in which the display data is input to perform display output of both the

display data and the form data or the case in which the input data and the form data are transmitted through a line.

[0050]

5 As described above, according to the embodiment, in the case where the attribute information is the resolution information or the paper-size information, the entered form data can be enlarged or reduced to perform the form overlay print when the resolution
10 information or the paper-size information of the entered form data does not corresponds to the resolution or the paper size of the print data.

[0051]

 Further, the intermediate data of the entered
15 form data can be re-created according to the print data to perform the print by the form overlay.

[0052]

 Further, according to the embodiments, since the amount of entered form data is independent of the
20 resolution of the print data and the like, the entry areas for the form area and the like can be effectively used.

[0053]

 Further, according to the embodiments, there is
25 the effect that the memory area in which the form data is entered can be decreased.

[0054]

[Effect of the Invention]

As described above, according to the invention, when the output is performed with the entered information, there is the effect that the output can
5 be performed by converting the entered information corresponding to the current attribute.

[0055]

Further, according to the invention, there is the effect that the output can be performed by
10 converting the resolution of the entered information into the resolution of the data.

[0056]

Further, according to the invention, there is the effect that the output can be performed by
15 converting the size of the entered information according to the size of the data received from the external device.

[0057]

Further, according to the invention, since it
20 is unnecessary that the resolution or size of the entered information is entered according to the resolution or size of the data from the external device, there is the effect that the entered information can be stored in the less memory capacity.

25 [0058]

[Brief Description of the Drawings]

Fig. 1 is a block diagram showing a

configuration of a controller of a laser beam printer according to an embodiment;

Fig. 2 is a flowchart showing a process of entering form data in a printer apparatus of the
5 embodiment from a host computer;

Fig. 3 is a flowchart showing a form overlay printing process in which the form data entered through the process of Fig. 2 is used;

Fig. 4 is a flowchart showing the process of to
10 receive the form data from the host computer to enter the form data in the printer apparatus in a second embodiment of the invention;

Fig. 5 is a flowchart showing the form overlay printing process in which the form data entered
15 through the process of Fig. 4 of the embodiment is used; and

Fig. 6 is a view showing a code data configuration of a storage medium in which a computer program of the embodiment is stored.

FIG. 1

101 HOST COMPUTER
102 RECEPTION BUFFER
104 COMMAND ANALYZING UNIT
5 105 IMAGING DATA PRODUCING UNIT
106 RASTERIZATION PROCESSING UNIT
107 DEGRADATION RASTERIZATION PROCESSING UNIT
108 RESOLUTION CONVERSION UNIT
110 ENGINE TRANSFER UNIT
10 112 IMAGING MEMORY
113 ENTRY IMAGING MEMORY
114 BAND RASTER MEMORY
115 DEGRADATION BAND RASTER MEMORY
116 PANEL I/F UNIT
15 117 ENGINE UNIT
118 OPERATION PANEL

FIG. 2

FORM DATA ENTRY

20 S1 RECEIVE FORM DATA
S2 ENTER FORM DATA AND RESOLUTION INFORMATION
END

FIG. 3

25 START
S11 RECEIVE PRINT DATA
S12 FORM OVERLAY DIRECTION?

S13 COMPARE TWO PIECES OF RESOLUTION INFORMATION?
S14 PERFORM IMAGING?
S15 REDUCTION PROCESS IS PERFORMED TO ENTERED FORM
DATA WHEN RESOLUTION OF ENTERED FORM DATA IS HIGHER
5 THAN THAT OF PRINT DATA, AND ENLARGEMENT PROCESS IS
PERFORMED TO ENTERED FORM DATA WHEN RESOLUTION OF
ENTERED FORM DATA IS LOWER THAN THAT OF PRINT DATA
S16 DISPLAY ATTRIBUTE INFORMATION OF ENTERED FORM
DATA AND RESULT OF REDUCTION OR ENLARGEMENT ON PANEL
10 S17 PERFORM IMAGING PROCESS
S18 PROCESS OF IMAGING ENTERED FORM DATA IS NOT
PERFORMED, BUT ONLY PROCESS OF IMAGING PRINT DATA IS
PERFORMED
S19 DISPLAY ATTRIBUTE INFORMATION OF ENTERED FORM
15 DATA ON PANEL
END

FIG. 4

FORM DATA ENTRY

20 S31 RECEIVE FORM DATA
S32 ADD PAPER-SIZE INFORMATION TO ENTER FORM DATA
END

FIG. 5

25 START
S41 RECEIVE PRINT DATA
S42 FORM OVERLAY DIRECTION?

S43 COMPARE PAPER SIZES?
S44 PERFORM IMAGING?
S45 REDUCTION PROCESS IS PERFORMED TO ENTERED FORM
DATA WHEN PAPER SIZE OF ENTERED FORM DATA IS LARGER
5 THAN THAT OF PRINT DATA, AND ENLARGEMENT PROCESS IS
PERFORMED TO ENTERED FORM DATA WHEN PAPER SIZE OF
ENTERED FORM DATA IS SMALLER THAN THAT OF PRINT DATA
S46 DISPLAY ATTRIBUTE INFORMATION OF ENTERED FORM
DATA AND RESULT OF REDUCTION OR ENLARGEMENT ON PANEL
10 S47 PERFORM IMAGING PROCESS
S48 PROCESS OF IMAGING ENTERED FORM DATA IS NOT
PERFORMED, BUT ONLY PROCESS OF IMAGING PRINT DATA IS
PERFORMED
S49 DISPLAY ATTRIBUTE INFORMATION OF ENTERED FORM
15 DATA ON PANEL
END

FIG. 6

DIRECTORY

20 INPUT PROCESSING MODULE
ENTRY PROCESSING UNIT
CONVERSION PROCESSING UNIT
CONTROL PROCESSING MODULE

[Written Amendment]

[Filed date] November 12, 2001

[Amendment 1]

[Object Document of Amendment] Specification

5 [Object Item of Amendment] Title of the Invention

[Amendment Method] Change

[Contents]

[Title of the Invention]

Method and Apparatus for Controlling Print

10 [Amendment 2]

[Object Document of Amendment] Specification

[Object Item of Amendment] What is Claimed is:

[Amendment Method] Change

[Contents]

15 [What is Claimed is:]

1. A print controlling apparatus which overlays
form overlay data onto print data, the apparatus
comprising:

entering means for entering the form overlay
20 data and attribute information for indicating a
resolution of the form overlay data;

comparing means for comparing the resolution of
the print data and the resolution of the form overlay
data when a direction that the print is performed
25 with the form overlay data entered in the entering
means is given;

notifying means for providing a notification

that the resolution of the print data is different from the resolution of the form overlay data, when the comparing means determines that the resolution of the print data is not equal to the resolution of the form overlay data; and

print controlling means for controlling form overlay print of the print data and the form overlay data according to an input direction performed in response to the notification provided by the notifying means.

2. A print controlling apparatus according to claim 1, wherein the print controlling means overlays the form overlay data onto the print data to produce image data and performs control so as to perform the print based on the image data.

3. A print controlling apparatus according to claim 2, wherein the print controlling means print the image data in a printer engine.

4. A print controlling apparatus according to claim 1, further comprising image data generating means for generating the image data of the form overlay data according to the resolution of the print data, when the comparing means determines that the resolution of the print data is not equal to the

resolution of the form overlay data.

5. A print controlling apparatus according to claim 4, wherein the image data generating means
5 generates the image data by rasterizing intermediate data which is obtained by converting the form overlay data.

6. A print controlling apparatus according to
10 claim 1, wherein the notifying means notifies a host computer which transmits the print data.

7. A print controlling apparatus according to claim 1, wherein the notifying means notifies a user
15 with an operation panel.

8. A print controlling apparatus according to claim 1, wherein the print controlling means further includes determining means for determining whether
20 the form overlay print of the print data and the form overlay data is performed by the input direction or not, and the print controlling means perform the control so as to perform the print based on the print data when the determining means determines that the
25 form overlay print is not performed.

9. A print controlling method of overlaying

form overlay data onto print data to perform print,
the method comprising the steps of:

entering the form overlay data and attribute
information for indicating a resolution of the form
5 overlay data;

comparing the resolution of the print data and
the resolution of the form overlay data when a
direction that the print is performed with the form
overlay data entered in the entering means is given;
10 providing a notification that the resolution of
the print data is different from the resolution of
the form overlay data, when the comparing means
determines that the resolution of the print data is
not equal to the resolution of the form overlay data;
15 and

controlling form overlay print of the print
data and the form overlay data according to an input
direction performed in response to the notification
provided by the notifying means.

20

10. A print controlling method according to
claim 9, wherein, in the print controlling step, the
form overlay data is overlaid onto the print data to
produce image data and the control is performed so
25 that the print is performed based on the image data.

11. A print controlling method according to

claim 10, wherein the image data is printed in a printer engine in the print controlling step.

12. A print controlling method according to
5 claim 9, further comprising a step of generating the image data of the form overlay data according to the resolution of the print data, when that the resolution of the print data is not equal to the resolution of the form overlay data is determined in
10 the comparing step.

13. A print controlling method according to claim 12, wherein, in the image data generating step, the image data is generated by rasterizing
15 intermediate data which is obtained by converting the form overlay data.

14. A print controlling method according to claim 9, wherein a host computer which transmits the
20 print data is notified in the notification providing step.

15. A print controlling method according to claim 9, wherein a user is notified with an operation
25 panel in the notification providing step.

16. A print controlling method according to

claim 9, wherein the print controlling step further includes a step of determining whether the form overlay print of the print data and the form overlay data is performed by the input direction or not, and
5 the control is performed so that the print is performed based on the print data when that the form overlay print is not performed is determined in the determining step.

[Amendment 3]

10 [Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0001

[Amendment Method] Change

[Contents]

[0001]

15 [Technical Field to which the Invention Pertains]

The present invention relates to a method and apparatus for controlling print, which enters, e.g. form overlay data to perform the print with the entered form overlay data.

20 [Amendment 4]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0004

[Amendment Method] Change

[Contents]

25 [0004]

In view of the foregoing, an object of the invention is to provide a method and apparatus for

controlling the print, which can print the entered form overlay data according to the resolution of the print data when the print is performed with the entered form overlay data.

5 [Amendment 5]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0005

[Amendment Method] Change

[Contents]

10 [0005]

Another object of the invention is to provide a method and apparatus for controlling the print, which can convert the resolution of the entered form overlay data according to the resolution of the print data to perform the print.

15

[Amendment 6]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0006

[Amendment Method] Deletion

20 [Amendment 7]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0007

[Amendment Method] Deletion

[Amendment 8]

25 [Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0008

[Amendment Method] Change

[Contents]

[0008]

In order to achieve the above object, a print
controlling apparatus of the invention includes the
5 following configuration. That is, a print
controlling apparatus which overlays form overlay
data onto print data, the apparatus comprising:
entering means for entering the form overlay data and
attribute information for indicating a resolution of
10 the form overlay data; comparing means for comparing
the resolution of the print data and the resolution
of the form overlay data when a direction that the
print is performed with the form overlay data entered
in the entering means is given; notifying means for
15 providing a notification that the resolution of the
print data is different from the resolution of the
form overlay data, when the comparing means
determines that the resolution of the print data is
not equal to the resolution of the form overlay data;
20 and print controlling means for controlling form
overlay print of the print data and the form overlay
data according to an input direction performed in
response to the notification provided by the
notifying means.

25 [Amendment 9]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0009

[Amendment Method] Deletion

[Amendment 10]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0010

5 [Amendment Method] Change

[Contents]

[0010]

 In order to achieve the above object, a print
controlling method of the invention includes the
10 following configuration. That is, a print
controlling method of overlaying form overlay data
onto print data to perform print, the method
comprising the steps of: entering the form overlay
data and attribute information for indicating a
15 resolution of the form overlay data; comparing the
resolution of the print data and the resolution of
the form overlay data when a direction that the print
is performed with the form overlay data entered in
the entering means is given; providing a notification
20 that the resolution of the print data is different
from the resolution of the form overlay data, when
the comparing means determines that the resolution of
the print data is not equal to the resolution of the
form overlay data; and controlling form overlay print
25 of the print data and the form overlay data according
to an input direction performed in response to the
notification provided by the notifying means.

[Amendment 11]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0011

[Amendment Method] Deletion

5 [Amendment 12]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0012

[Amendment Method] Deletion

[Amendment 13]

10 [Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0054

[Amendment Method] Change

[Contents]

[0054]

15 [Effect of the Invention]

As described above, according to the invention,
when the print is performed with the entered form
overlay, there is the effect that the print can be
performed by converting the entered form overlay data

20 according to the resolution of the print data.

[Amendment 14]

[Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0055

[Amendment Method] Change

25 [Contents]

[0055]

Further, according to the invention, there is

the effect that the resolution of the entered form overlay data can be converted according to the resolution of the print data to perform the print.

[Amendment 15]

5 [Object Document of Amendment] Specification

[Object Item of Amendment] Paragraph No. 0056

[Amendment Method] Deletion

[Amendment 16]

[Object Document of Amendment] Specification

10 [Object Item of Amendment] Paragraph No. 0057

[Amendment Method] Deletion